

CLAIMS

1. (Amended) A manufacturing method of a fuel cell, which
comprises a hydrogen-permeable metal layer of a hydrogen-permeable

5 metal and an electrolyte layer that is located on the hydrogen-permeable
metal layer and has proton conductivity, said manufacturing method
comprising:

forming a thin electrolyte layer on the hydrogen-permeable metal
layer, wherein the electrolyte layer has pores; and

10 forming a conductive layer on the formed thin electrolyte layer
electronically-discontinued with the hydrogen-permeable metal layer via
the pores, wherein the conductive layer has electrical conductivity.

2. A manufacturing method in accordance with claim 1, wherein
15 the conductive layer is an electrode.

3. (Amended) A manufacturing method in accordance with either
one of claims 1 and 2, wherein said forming a conductive layer is
implemented by releasing a conductive material toward the thin
20 electrolyte layer in a direction perpendicular to the thin electrolyte layer,
so as to form the conductive layer that is thinner than the thin
electrolyte layer.

4. (Amended) A manufacturing method in accordance with either
25 one of claims 1 and 2, wherein said forming a conductive layer is

implemented by releasing a conductive material toward the thin electrolyte layer at a specific angle that prevents the conductive material from being deposited on surface of the hydrogen-permeable metal layer, which is exposed on the pores present in the thin electrolyte layer, so as to form the conductive layer.

5 5. A manufacturing method in accordance with either one of claims 3 and 4, wherein said forming a conductive layer is implemented by adopting a vacuum deposition technique to form the conductive layer.

10 6. (Amended) A manufacturing method in accordance with either one of claims 1 and 2, wherein said forming the conductive layer further comprises:

forming a dielectric layer in the pores present in the thin electrolyte layer, wherein the dielectric layer is mainly made of an insulating material and blocks off a connection between surface of the hydrogen-permeable metal layer, which is exposed on the pores present in the thin electrolyte layer, and outside of the pores; and

15 coating the thin electrolyte layer and the dielectric layer formed in the pores of the thin electrolyte layer with the conductive layer.

20 7. (Amended) A manufacturing method in accordance with claim 6, wherein said forming a dielectric layer is implemented by filling the pores of the thin electrolyte layer with dielectric fine particles to form the dielectric layer.

8. (Amended) A manufacturing method in accordance with claim 6, wherein said forming a dielectric layer is implemented by coating inside of the pores of the thin electrolyte layer with an insulating material by plating to form the dielectric layer.

9. (Amended) A manufacturing method in accordance with claim 6, wherein said forming a dielectric layer further comprises:

coating inside of the pores of the thin electrolyte layer with a metal, which is oxidized to an insulating material, to form a metal coat layer; and

oxidizing the metal coat layer to form the dielectric layer.

10. (Amended) A manufacturing method in accordance with either one of claims 1 and 2, wherein said forming a conductive layer comprises:

filling the pores present in the thin electrolyte layer with fine particles;

forming the conductive layer on the thin electrolyte layer having the pores filled with the fine particles; and

removing the fine particles from the pores, subsequent to said forming the conductive layer on the thin electrolyte layer.

11. A manufacturing method in accordance with claim 10, wherein said removing the fine particles is implemented by adopting a chemical technique to remove the fine particles.

12. A manufacturing method in accordance with claim 10, wherein said removing the fine particles is implemented by adopting a physical technique to remove the fine particles.

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13. (Amended) A manufacturing method in accordance with either one of claims 1 and 2, wherein said forming a conductive layer comprises: forming a protective layer to cover the thin electrolyte layer; and forming the conductive layer on the protective layer.

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14. (Amended) A manufacturing method in accordance with claim 13, wherein said forming a conductive layer further comprises:

removing the protective layer and fixing the conductive layer to the thin electrolyte layer.

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15. A manufacturing method in accordance with claim 13, wherein the protective layer is mainly made of an insulating material having proton conductivity.

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16. (Amended) A manufacturing method in accordance with either one of claims 1 and 2, wherein said forming a conductive layer is implemented by coating the thin electrolyte layer with particles of an electrically conductive material having a greater particle diameter than a width of the pores present in the thin electrolyte layer, so as to form the conductive layer.

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17. (Amended) A manufacturing method in accordance with claim 16, wherein said forming a conductive layer is implemented by adopting one of arc ion plating, emulsion deposition, and cluster beam deposition techniques to coat the thin electrolyte layer with the electrically conductive material.

18. (Amended) A manufacturing method in accordance with either one of claims 1 and 2, wherein said forming a conductive layer is implemented by applying a paste, which contains an electrically conductive material and has a predetermined level of viscosity for effectively preventing invasion of the paste into the pores present in the thin electrolyte layer, onto the thin electrolyte layer, so as to form the conductive layer.

19. (Amended) A manufacturing method in accordance with either one of claims 1 and 2, wherein said forming a conductive layer comprises: forming a conductive film of an electrically conductive material; and transferring the conductive film onto the thin electrolyte layer, so as to form the conductive layer.

20. (Amended) A fuel cell comprising a hydrogen-permeable metal layer of a hydrogen-permeable metal and an thin electrolyte layer that is located on the hydrogen-permeable metal layer and has proton

conductivity,

said fuel cell being manufactured by a manufacturing method in
accordance with any one of claims 1 through 19.
